DOCUMENT RESUME

ED 174 962 CS 004 952

AUTHOR Thelen, Judith N.
TITLE Role of Pre-Reading in Content Learning.
PUB DATE Jun 79
NOTE 10p.: Paper presented at the Annual Meeting of the West Virginia University Reading Center (1st, Morgantown, West Virginia, June 27-29, 1979)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Advance Organizers: *Concept Formation: *Content Reading: Elementary Secondary Education: *Learning Processes: *Reading Comprehension: *Reading Research: Student Experience: Teacher Role: Teaching Techniques: Textbook Content

ABSTRACT

Instead of urging content area teachers to teach reading skills, reading personnel should be providing them with prereading techniques designed to organize or provide experiences relevant to new concepts to be learned by students. Among the conclusions reached from a review of relevant research are that using multi-leveled textbooks in a classroom will not produce statistically significant gains in cognitive achievement and that students' problems in content reading stem not from lack of reading skills but from comprehension problems due to lack of relevant background knowledge. One prereading technique, which proved successful in a study involving social studies instruction, involves presenting many examples and nonexamples of relevant (critical) attributes of concepts to help students clarify the concepts. In another technique, which employs graphic postorganizers, students construct their own hierarchy of terms used in the material they have learned. These techniques enable teachers to ascertain what learners already know and to teach them accordingly, using both receptive and discovery learning techniques. Teachers should be the primary sources of information: textbooks should be used to reinforce concepts they have previously developed. (GT)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED174962

ROLE OF PRE-READING IN CONTENT LEARNING

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Judith N. Thelen

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Dr. Judith N. Thelen
Professor of Education
Frostburg State College
Frostburg, Maryland 21532

CS004952

The primary source of information in our classrooms should be the teacher. Yet, we are constantly hearing the complaint from administrators, content teachers, parents and the press that students can't read their assigned textbooks and as a result are not learning. Why should the responsibility for learning be placed on students' inability to learn from the textbooks? A good nurseryman would hardly blame the quality of his plants on his tools.

Yet, some educators suggest that teachers re-write the content material at a lower level of difficulty. Teachers will tell you that it is impractical and time-consuming to do so. Others advise a similar course by suggesting multi-leveled textbooks. However, research by Daugs (1973) shows no statistically significant differences in cognitive achievement gains between classrooms using multi-level textbooks and those using one level of material.

Many advocate the teaching of reading skills such as word attack to aid the frustrated reader. Skill in word identification does not necessarily guarantee that a student will not exhibit comprehension difficulties (Oaken, 1971). Research by Kulm (1973, 1974) and Knifong and Hiltan (1976) indicate that reading related skills are not the central skills in solving problems.

Hill (1967) reviewed several studies dealing with the use of textbooks and concluded that "there is solid evidence to confirm that the content area textbook, as traditionally used, is less help, and possibly more hindrance to the student than commonly assumed (p. 412)."

Kintsch and Kosminsky (1977) declare that many of the so-called reading problems of poor readers are, in fact, comprehension problems. And that's the point--students are failing because they can't comprehend or understand

what they read! Perhaps it is not a reading problem but a pre-reading problem!

Goodman (1968) tells us that it is one's knowledge of the language and of the world that provides a framework for comprhension and by bringing this knowledge to bear on the textbook, the comprehender actively constructs meaning. By knowledge of the world he means what the student already knows.

Over a decade ago Ausubel (1968) alluded to this when he said, "If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly." (pvi) More recently science educators West and Fensham (1970) acknowledged that one of the most important variables that influence science learning is the learner's relevant background knowledge.

Another science educator, Novak (1976) suggested that "there is a growing body of evidence to indicate that some reasonable degree of learning for most any concept can take place if proper instructional sequences are provided and examples and activities are used that will relate to the prior experience of the learner (p. 504)."

If students have nothing in their prior experiences that is relevant to new material to be read they often attempt to memorize it. Ausubel and Robinson (1969) warn us that "students develop a rote learning set if they are under excessive pressure to exhibit glibness, or to conceal rather than admit, and gradually remedy, an original lack of understanding. Under these circumstances it seems easier and more important to create a spurious impression of facile comprehension by rotely memorizing a few key terms or

sentences than to try to understand what they mean." (p. 58) Rather than observe, apply concepts, interpret, interrelate to learger concepts and solve problems, Novak (1976) says the sequence becomes: observe, memorize, test and forget!

Boredom is another side effect of lack of prior knowledge. When students cannot make sense out of what they are expected to read they become bored (Smith, 1978) and may withdraw from the learning situation entirely by refusing to do classroom assignments, missing classes and/or becoming discipline problems in class (Waetjen, 1965).

Instead of admonishing content teachers with the old and questionable cliche "Every teacher is a teacher of reading" reading personnel should be providing content teachers with pre-reading techniques designed to organize and/or provide experiences for new concepts.

One technique that has been used successfully by Peters (1975-76) is the Frayer model of concept attainment. This paradigm suggests clarifying concepts according to five nonsequential dimensions: hierarchical relationships established with other concepts, examples, non-examples, relevant (critical) attributes, irrelevant (non-critical) attributes.

One dimension, that reflects current thinking on schema, suggests showing students how the new concept relates to other concepts in a hierarchy. This dimension is very similar to Barron's (1969) graphic organizer.

Since many textbooks provide only one or two examples of a new concept, Frayer recommends presenting many examples and non-examples. By examining the examples the teacher can identify those properties or characteristics that are common to each example. These characteristics are called relevant attributes. Those properties or characteristics which vary from example to example are labeled irrelevant or non-critical attributes.

Peters used Frayer's model in developing social studies materials and compared it to the traditional textbook approach. His results indicated that both good and poor readers who used the rewritten material based on Frayer's model received significantly higher comprehension scores than did good and poor readers who used the textbook method.

For meaningful learning to occur Ausubel and Robinson (1969) state that three conditions must hold:

1. the material presented must be capable of being related in some sensible fashion.
2. the learner must possess relevant ideas to which this new idea can be related or anchored
3. the learner must actually attempt to relate the new ideas to those which he presently possesses

Using Frayer's model prior to assigning new material is an attempt to establish condition one and two. The third condition appears to be one of involvement and motivation. Even if the material is logically meaningful and the learner has the appropriate ideas in his prior experiences, rote learning will still take place if the learner intends on memorizing. He or she must intend to relate this new material to items in their prior experiences.

Barron and Stone (1973) were successful in involving the learning by using graphic post-organizers. After the student learned the material they were placed in groups of two or three and provided with the learning passage and a set of 3 x 5 cards on which were typed terms taken from the graphic pre-organizer and used with another group of students. These students were then given twenty minutes to arrange the cards in a way that would depict relationships among the terms used in the learning passage. In effect,

the students were constructing their own hierarchy. They were actually attempting to relate the new ideas and meaningful learning did occur.

There has been some concern expressed, especially by science teachers, over Ausubel's theory (referred to as receptive learning). So many of our students appear to utilize only concrete thoughts and are not reading for formal operational thoughts. Therefore, they must engage in discovery learning as opposed to receptive learning. These learners "receive" the concepts to be learned in final form when given a hierarchy. In discovery learning the learners must act on the material in order to be led in the final form of the concept. In both instances the material in its final form must be related to cognitive structure (Quimby, 1976). Frayer's model enables the teacher to ascertain what the learner already knows and teach him accordingly using both receptive and discovery learning techniques.

It is the teacher, not the textbook, who is the primary source of information. Most teachers would agree that their responsibility is to help their students understand the concepts of their discipline as fully as they can.

If the theory of prior knowledge prevails then it would appear that the teacher's first task is to discover what is in the learner's existing prior experiences and teach so that the new material to be learned can be sensibly related. Textbooks cannot and should not assume that responsibility. This does not mean to suggest that schools should rid themselves of textbooks. It means that the textbooks should be used to reinforce, confirm, or enrich those concepts that the teacher is responsible for developing. It should be used as Esler (1973) suggests, only after the

students have acquired an understanding of the concepts. The reader, when provided with sufficient background concerning the new material, should find the textbook easier to read.

BIBLIOGRAPHY

Ausubel, D. P. Educational Psychology: A Cognitive View, New York: Holt, Rinehart and Winston, 1968.

Ausubel, D. P. and Robinson, F. G. School Learning - An Introduction to Educational Psychology, New York: Holt, Rinehart and Winston, 1969.

Barron, R. F. "The Use of Vocabulary as an Advance Organizer" in H. L. Herber and P. Sanders (eds.) Research in Reading in the Content Areas: First Year Report. Syracuse, New York: Syracuse University Press, 1969, 29-39.

Barron, R. F. and Stone, V. F. "The Effects of Student Constructed Graphic Post Organizers Upon Learning of Vocabulary Relationships from a Passage of Social Science Content", Paper presented at the 1973 National Reading Conference.

Daugs, D. "Influence of Multi-Level Science Materials on Achievement of Sixth Grade Students", Journal of Research in Science Teaching, (1973), 19 (2); 147-152.

Esler, W. K. "Putting it all Together - Inquiry, Process, Science Concepts and the Textbook", Science Education, 1973, 57, (1), 19-23.

Goodman, K. The Psycholinguistic Nature of the Reading Process, Detroit: Wayne State University Press, 1968.

Herber, H. Teaching Reading in the Content Areas (2nd ed.), Englewood Cliffs: New Jersey, 1978.

Hill, W. "Content Textbook: Help or Hindrance?", Journal of Reading, March, 1967, 10, 408-413.

Kintsch, W. and Kozminsky, E. "Summarizing Stories After Reading and Listening", Journal of Educational Psychology, 1977, 69 (5), 491-499.

Knifong, J. D. and Holtan, B. "An Analysis of Children's Written Solutions to Word Problems", Journal of Research in Mathematics, 1976 (7), 106-111.

Kulm, G. "Sources of Reading Difficulty in Elementary Algebra Textbooks", Mathematics Teacher, November, 1973, 649-652.

Kulm, G., Lewis, J. F., Omari, I. and Cook, H. "The Effectiveness of Textbooks, Student Generated, and Fictional Versions of Presenting Mathematical Problems in Ninth Grade Algebra", Journal of Research in Mathematics Education, January, 1974, 28-35.

Novak, J. D. "Understanding the Learning Process and Effectiveness of Teaching Methods in the Classroom, Laboratory and Field", Science Education, 1976, 60 (4), 493-517.

Oaken, R., Wiener, M. and Cromer, W. "Identification, Organization, and Reading Comprehension for Good and Poor Readers", Journal of Educational Psychology, 1971, 62, 71-78.

Olson, A. V. and Ames, W. S. Teaching Reading Skills in Secondary Schools, Scranton, PA: Intext Educational Publishers, 1972.

Peters, C. W. "The Effect of Systematic Restructing of Material Upon the Comprehension Process", Reading Research Quarterly, 1975-76, 11 (1). 97-111.

Quimby, L. (Review of Improving Reading in Science by J. N. Thelen), The American Biology Teacher, 1976, 38, 558-559.

Smith, F. Understanding Reading--A Psycholinguistic Analysis of Reading and Learning to Read (2nd Ed.), New York: Holt, Rinehart and Winston, 1978.

Waetjen, W. B. "Learning and Motivations: Implications for the Teaching of Science", The Science Teacher, May, 1965, 22-26.

West, L. H. and Fensham, P. J. "Prior Knowledge or Advance Organizers as Effective Variable in Chemical Learning", Journal of Research in Science Teaching, 1976, 13 (4), 297-306.